

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMITS

Minor Industrial Permit No. **UT0025283**

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the "Act"),

THE ENSIGN-BICKFORD COMPANY

is hereby authorized to discharge from its facility located near Mapleton UT in Utah County, Utah with outfalls located at the following:

<u>Outfall</u>	<u>Latitude</u>	<u>Longitude</u>	<u>To receiving waters named</u>
001 (Mapleton GAC + Orton GAC)	40° 08' 52"	111° 34' 40"	Hobble Creek
002 (Spanish Fork GAC)	40° 05' 06"	111° 35' 21"	Spanish Fork River

in accordance with the discharge point, effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective May 1, 2014.

This permit and the authorization to discharge shall expire at midnight April 30, 2019.

Signed this 7 day of May, 2014



Walter L. Baker, P.E.
Director

Table of Contents

Outline	Page Number
I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS.....	1
A. Description of Discharge Point(s)	1
B. Narrative Standard.....	1
C. Specific Limitations and Self-Monitoring Requirements.....	1
D. Reporting of Wastewater Monitoring Results	7
II. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS	8
A. Representative Sampling.....	8
B. Monitoring Procedures	8
C. Penalties for Tampering	8
D. Compliance Schedules	8
E. Additional Monitoring by the Permittee.....	8
F. Records Contents.....	8
G. Retention of Records	8
H. Twenty-four Hour Notice of Noncompliance Reporting	8
I. Other Noncompliance Reporting.....	9
J. Inspection and Entry.....	9
III. COMPLIANCE RESPONSIBILITIES	10
A. Duty to Comply	10
B. Penalties for Violations of Permit Conditions.....	10
C. Need to Halt or Reduce Activity not a Defense	10
D. Duty to Mitigate	10
E. Proper Operation and Maintenance.....	10
F. Removed Substances.....	10
G. Bypass of Treatment Facilities	11
H. Upset Conditions	12
I. Toxic Pollutants.....	12
J. Changes in Discharge of Toxic Substances.....	13
K. Industrial Pretreatment	13
IV. GENERAL REQUIREMENTS.....	14
A. Planned Changes	14
B. Anticipated Noncompliance	14
C. Permit Actions.....	14
D. Duty to Reapply.....	14
E. Duty to Provide Information	14
F. Other Information.....	14
G. Signatory Requirements	14
H. Penalties for Falsification of Reports	15
I. Availability of Reports	15
J. Oil and Hazardous Substance Liability	15
K. Property Rights.....	15
L. Severability.....	15
M. Transfers.....	16
N. State or Federal Laws	16
O. Industrial Pretreatment	16
P. Water Quality - Reopener Provision	16
Q. Biosolids – Reopener Provision	17
R. Toxicity Limitation - Reopener Provision.....	17
S. Storm Water-Reopener Provision.....	17
V. DEFINITIONS	18
A. Wastewater	18

I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS

- A. Description of Discharge Point. The authorization to discharge wastewater provided under this part is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

<u>Outfall Number</u>	<u>Location of Discharge Outfall</u>
001	Discharge to Hobble Creek. The final discharge is located at a latitude of 40° 08' 52" and a longitude of 111° 34' 40". Compliance samples to be taken in the Mapleton GAC and Orton GAC buildings before discharge to Hobble Creek or Mapleton City pressurized irrigation system.
002	Discharge to the Spanish Fork River. This discharge is located at a latitude of 111° 35' 21" and a longitude of 40° 05' 06". Compliance samples to be taken in the GAC building before discharge to the Spanish Fork River or Spanish Fork pressurized irrigation system.

- B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

1. From the effective date of this permit, and lasting through the life of this permit, there shall be no acute or chronic toxicity in Outfall 001 or Outfall 002 as defined in *Part V*, and determined by test procedures described in *Part I. C.2* of this permit.

Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

Table 1: Effluent Limitations Outfall 001				
Parameter, Units	30-Day Average	7-Day Average	Daily Minimum	Daily Maximum
pH, S.U.	NA	NA	6.5	9.0
Nitrate-Nitrogen, mg/L	NA	NA	NA	a/
RDX, ug/L /b	NA	NA	NA	a/
Flow, cfs	NA	NA	NA	3.34
DO, mg/L	NA	NA	4.5, c/	NA
WET Testing	NA	NA	NA	Pass/Fail d/

a/ Nitrate nitrogen and RDX limitations are based upon effluent flow ranges as indicated in the tables below. The permittee is required to meet the RDX and nitrate-nitrogen concentrations of the flow range associated with the highest flow rate of the month. The permittee is not allowed to discharge more than 3.34 cfs at any time.

b/ Analyses of RDX shall be made by the method appended to the fact sheet and statement of basis in Appendix A, or by any other method approved in writing by the Director.

c/ DO limits are only applicable during non-irrigation season (November-March)

d/ Acute Pass LC₅₀, Chronic Pass for Outfall 001 IC₂₅ => 46.3% effluent, Outfall 2 IC₂₅ => 22% effluent.

Table 2: RDX And Nitrate-Nitrogen Limits Based for Outfall 001		
Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate-Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0285	128.9
0.57 - 1.11	0.0152	69.1
1.12 - 1.67	0.0106	48.8
1.68 - 2.23	0.0070	32.5
2.34 - 2.79	0.0050	23.5
2.80 - 3.34	0.0041	19.3

Table 3: RDX And Nitrate-Nitrogen Limits Based for Outfall 002		
Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate-Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0449	124.1
0.57 - 1.11	0.0236	67.6
1.12 - 1.67	0.0164	48.3
1.68 - 2.23	0.0128	38.7
2.34 - 2.79	0.0106	32.9
2.80 - 3.34	0.0092	29.1

*Assumes an upstream (background) nitrate-nitrogen concentration of 1 mg/L.

Table 4: Self-Monitoring and Reporting Requirements a/			
Parameter	Sampling Frequency	Sample Type	Units
pH	Monthly	Immediate	S.U.
Nitrate Nitrogen	Monthly	Grab	mg/L
RDX	Monthly	Grab	mg/L
Flow b/ c/	Continuous	Recorded	cfs
DO	Monthly	Immediate	mg/L
WET	Yearly /d	Grab	Pass/Fail

a/ See Definitions, *Part VIII*, for definition of terms.

b/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

c/ If the flow in the Spanish Fork River immediately upstream of the point where this discharge enters the river drops below 12 cfs (7.8 MGD) the permittee shall cease discharging until the upstream flow again exceeds 12 cfs

/d The facility shall alternate between the Chronic and Acute tests.

2. Whole Effluent Toxicity Testing WET Testing shall occur on a Biennial basis, alternating between the two test species. These tests shall be alternated over two six month periods, one for each species during each year of the permit

- a. Acute Whole Effluent Toxicity (WET) Testing

- (1) *Whole Effluent Testing – Acute Toxicity.* Starting on the effective date of this permit, the permittee shall conduct Biennial acute static replacement toxicity tests, with alternating species as indicated below, on a grab sample of the final effluent. The sample shall be collected at Outfall 001 and Outfall 002.

- (2) The monitoring frequency for acute tests shall be Biennial, as indicated below, unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See *Part I.C.2.c, Accelerated Testing*). Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.
- (3) The replacement static acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition, (EPA 821/R/02/012), October 2002*, as per *40 CFR 136.3(a) TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS*, and the *Region VIII EPA NPDES Acute Test Conditions – Static Renewal Whole Effluent Toxicity Test (August, 1997)*. The permittee shall conduct the 48-hour static replacement toxicity test using Ceriodaphnia dubia and the acute 96-hour static replacement toxicity test using Pimephales promelas (fathead minnow).
- (4) Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. A variance to this requirement may be granted by the Director if a mortality of less than 10 percent was observed in higher effluent dilutions.
- (5) Biennial test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Acute Whole Effluent Reporting (August, 1997)* and shall include all chemical and physical data as specified.
- (6) If the results for a minimum of 10 consecutive tests indicate no acute toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Director may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

b. Chronic Whole Effluent Toxicity (WET) Testing

- (1) *Whole Effluent Testing – Chronic Toxicity.* Starting on the effective date of this permit, the permittee shall biennial, conduct chronic short-term toxicity tests on a composite sample of the final effluent. The sample shall be collected at outfall 001 and Outfall 002.
- (2) The monitoring frequency shall be biennial. Samples shall be collected on a two-day progression; i.e., if the first sample is on a Monday, during the next sampling period, sampling shall be on a Wednesday. If chronic toxicity is detected, the test shall be repeated in less than four weeks from the date the initial sample was taken. The need for any additional samples, and/or a Toxicity Reduction Evaluation (TRE), see *Part I.C.2.f*, shall be determined by the Director. If the second test shows no chronic toxicity, routine monitoring shall be resumed.

- (3) The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms*, 4th Edition, (EPA 821/R-02-13), October 2002 as per 40 CFR 136.3(a) TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS, and the *Region VIII EPA NPDES Chronic Test Conditions - Static Renewal Whole Effluent Toxicity Test* (August, 1997). Test species shall consist of Ceriodaphnia dubia and Pimephales promelas (fathead minnow).
 - (4) Chronic toxicity occurs for Outfall 001 when the $IC_{25} \leq 46.3$ % effluent and for Outfall 002 when the $IC_{25} \leq 22\%$ effluent. If any of the acceptable control performance criteria are not met, the test shall be considered invalid.
 - (5) Test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar year (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Chronic Whole Effluent Reporting* (August, 1997) and shall include all the physical testing as specified.
 - (6) If the results for a minimum of ten consecutive tests indicate no chronic toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Director may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.
 - (7) The current Utah whole effluent toxicity (WET) policy is in the process of being updated and revised to assure its consistency with the Environmental Protection Agency's national and regional WET policy. When said revised WET policy has been finalized and officially adopted, this permit will be reopened and modified to incorporate satisfactory follow-up chronic toxicity language (chronic pattern of toxicity, PTI and/or TIE/TRE, etc.) without a public notice, as warranted and appropriate.
- c. *Accelerated Testing.* When acute or Chronic toxicity is indicated during routine biomonitoring as specified in this permit, the permittee shall notify the Director in writing within five (5) days after becoming aware of the test result. The permittee shall perform an accelerated schedule of biomonitoring to establish whether a pattern of toxicity exists. Accelerated testing will begin within seven (7) days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under *Part I.C.2.c Pattern of Toxicity*. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.
- d. *Pattern of Toxicity.* A pattern of toxicity is defined by the results of a series of up to five (5) biomonitoring tests pursuant to the accelerated testing requirements using 100 percent effluent on the single species found to be more sensitive, once every week for up to five (5) consecutive weeks.

If two (2) consecutive tests (not including the scheduled Biennial test which triggered the search for a pattern of toxicity) do not result in acute or chronic

toxicity, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Director within five (5) days, and resume routine monitoring.

A pattern of toxicity is established if one of the following occurs:

- (1) If two (2) consecutive test results (not including the scheduled Biennial test, which triggered the search for a pattern of toxicity) indicate acute toxicity, this constitutes an established pattern of toxicity.
- (2) If consecutive tests continue to yield differing results each time, the permittee will be required to conduct up to a maximum of five (5) acute tests (not including the scheduled Biennial test which triggered the search for a pattern of toxicity). If three out of five test results indicate acute toxicity, this will constitute an established pattern of toxicity.

e. *Preliminary Toxicity Investigation.*

- (1) When a pattern of toxicity is detected the permittee will notify the Director in writing within five (5) days and begin an evaluation of the possible causes of the toxicity. The permittee will have fifteen (15) working days from demonstration of the pattern to complete a Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Director. The PTI may include, but is not limited to, additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if a spill may have occurred, and similar procedures.
- (2) If the PTI identifies a probable toxicant and/or a probable source of toxicity the permittee shall submit, as part of its final results written notification of that effect to the Director. Within thirty (30) days of completing the PTI the permittee shall submit for approval a control program to control effluent toxicity and shall proceed to implement such a plan within seven (7) days following approval. The control program, as submitted to or revised by the Director, may be incorporated into the permit.
- (3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Director as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (See *Part I.C.2.e, Toxicity Reduction Evaluation*).
- (4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Director as part of the reporting requirements of paragraph (1). of this section.

f. *Toxicity Reduction Evaluation (TRE).* If toxicity is detected during the life of this permit and it is determined by the Director that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is *not* limited to one, all, or a combination of the following:

- (1) Phase I – Toxicity Characterization
- (2) Phase II – Toxicity Identification Procedures
- (3) Phase III – Toxicity Control Procedures
- (4) Any other appropriate procedures for toxicity source elimination and control.

If the TRE establishes that the toxicity cannot be immediately eliminated, the permittee shall submit a proposed compliance plan to the Director. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Director, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

- (a) Submit an alternative control program for compliance with the numerical requirements.
- (b) If necessary, provide a modified biomonitoring protocol, which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Director, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Director, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Director, shall be considered a violation of this permit.

- D. Reporting of Wastewater Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on DATE. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part IV.G)*, and submitted to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

II. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS

- A. Representative Sampling Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge.
- B. Monitoring Procedures Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10*.
- C. Penalties for Tampering The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. Compliance Schedules Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.
- E. Additional Monitoring by the Permittee If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.
- F. Records Contents Records of monitoring information shall include:
2. The date, exact place, and time of sampling or measurements;
 3. The individual(s) who performed the sampling or measurements;
 4. The date(s) and time(s) analyses were performed;
 5. The individual(s) who performed the analyses;
 6. The analytical techniques or methods used; and,
 7. The results of such analyses.
- G. Retention of Records The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location
- H. Twenty-four Hour Notice of Noncompliance Reporting
1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24-hour answering service (801) 536-4123.
 2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

- a. Any noncompliance which may endanger health or the environment;
 - b. Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part III.G, Bypass of Treatment Facilities.*);
 - c. Any upset which exceeds any effluent limitation in the permit (See *Part III.H, Upset Conditions.*);
 - d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,
3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
- a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected;
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and,
 - e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.
4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.
5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results.*
- I. Other Noncompliance Reporting Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part II.F*
- J. Inspection and Entry The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

- A. Duty to Comply The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.
- B. Penalties for Violations of Permit Conditions The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under UCA 19-5-115(2) a second time shall be punished by a fine not exceeding \$50,000 per day. Except as provided at Part III.G, *Bypass of Treatment Facilities* and Part III.H, *Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.
- C. Need to Halt or Reduce Activity not a Defense It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. Duty to Mitigate The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.
- E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- F. Removed Substances Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities

1. **Bypass Not Exceeding Limitations** The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to paragraph 2 and 3 of this section.
2. **Prohibition of Bypass**
 - a. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - (1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;
 - (2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and
 - (3) The permittee submitted notices as required under *section III.G.3.*
 - b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in *sections III.G.2.a (1), (2) and (3).*
3. **Notice**
 - a. *Anticipated bypass.* Except as provided above in *section III.G.2* and below in *section III.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Director:
 - (1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages;
 - (2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Director in advance of any changes to the bypass schedule;
 - (3) Description of specific measures to be taken to minimize environmental and public health impacts;
 - (4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

PART III
DISCHARGE PERMIT NO. UT0025283

(5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

(6) Any additional information requested by the Director.

b. *Emergency Bypass.* Where ninety days advance notice is not possible, the permittee must notify the Director, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Director the information in *section III.G.3.a.(1) through (6)* to the extent practicable.

c. *Unanticipated bypass.* The permittee shall submit notice of an unanticipated bypass to the Director as required under *Part II.H.1, Twenty Four Hour Reporting*. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions

1. *Effect of an upset* An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2 of this section are met. Director's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. *Conditions necessary for a demonstration of upset.* A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the permittee can identify the cause(s) of the upset;

b. The permitted facility was at the time being properly operated;

c. The permittee submitted notice of the upset as required under *Part II.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

d. The permittee complied with any remedial measures required under *Part III.D, Duty to Mitigate*.

3. *Burden of proof.* In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. *Toxic Pollutants.* The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of *The Water Quality Act of 1987* for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

PART III
DISCHARGE PERMIT NO. UT0025283

- J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Director as soon as the permittee knows of, or has reason to believe:
1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - a. One hundred micrograms per liter (100 ug/L);
 - b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,
 - d. The level established by the Director in accordance with *UAC R317-8-4.2(6)*.
 2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - a. Five hundred micrograms per liter (500 ug/L);
 - b. One milligram per liter (1 mg/L) for antimony;
 - c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,
 - d. The level established by the Director in accordance with *UAC R317-8-4.2(6)*.
- K. Industrial Pretreatment Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

IV. GENERAL REQUIREMENTS

- A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Director of any planned changes at least 30 days prior to their implementation.
- B. Anticipated Noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.
- C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.
- E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.
- F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.
- G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.
 - 1. All permit applications shall be signed by either a principal executive officer or ranking elected official.
 - 2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Director, and,

PART IV
DISCHARGE PERMIT NO. UT0025283

- b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.
- c. Changes to authorization. If an authorization under *paragraph IV.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph IV.G.2* must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.
- d. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. Penalties for Falsification of Reports The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.
- I. Availability of Reports Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Director. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.
- J. Oil and Hazardous Substance Liability Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.
- K. Property Rights The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- L. Severability The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held

PART IV
DISCHARGE PERMIT NO. UT0025283

invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

- M. Transfers This permit may be automatically transferred to a new permittee if:
1. The current permittee notifies the Director at least 20 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.
- N. State or Federal Laws Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.
- O. Industrial Pretreatment Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.
- In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).
- P. Water Quality - Reopener Provision This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.
 2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

PART IV
DISCHARGE PERMIT NO. UT0025283

3. Revisions to the current CWA § 208 area wide treatment management plans or promulgations/revisions to TMDLs (40 CFR 130.7) approved by the EPA and adopted by DWQ which calls for different effluent limitations than contained in this permit.
- Q. Biosolids – Reopener Provision This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state or federal regulations.
- R. Toxicity Limitation - Reopener Provision This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;
1. Toxicity is detected, as per *Part I.C.2* of this permit, during the duration of this permit.
 2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Director agrees with the conclusion.
 3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Director agrees that numerical controls are the most appropriate course of action.
 4. Following the implementation of numerical control(s) of toxicant(s), the Director agrees that a modified biomonitoring protocol is necessary to compensate for those toxicant that are controlled numerically.
 5. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.
- S. Storm Water-Reopener Provision At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

V. DEFINITIONS

A. Wastewater

1. The "7-day (and weekly) average", other than for e-coli bacteria, fecal coliform bacteria, and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for e-coli bacteria, fecal coliform bacteria, and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.
2. The "30-day (and monthly) average," other than for e-coli bacteria, fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for e-coli bacteria, fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.
3. "Act," means the *Utah Water Quality Act*.
4. "Acute toxicity" occurs when 50 percent or more mortality is observed for either test species at 25% effluent concentration.
5. "Bypass," means the diversion of waste streams from any portion of a treatment facility.
6. "Chronic toxicity" occurs when the survival, growth, or reproduction for either test species exposed to a dilution of 46.3 percent effluent (or lower) for Outfall 001 and 22 % effluent (or lower) for Outfall 002 is significantly less (at the 95 percent confidence level) than the survival, growth, or reproduction of the control specimens.
7. "Composite Samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:
8. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

PART V
DISCHARGE PERMIT NO. UT0025283

9. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;
10. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,
11. Continuous sample volume, with sample collection rate proportional to flow rate.
12. "CWA," means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.
13. "Daily Maximum" (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.
14. "EPA," means the United States Environmental Protection Agency.
15. "Director," means Director of the Utah Water Quality Board.
16. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.
17. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.
18. "Severe Property Damage," means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
19. "Upset," means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

**FACT SHEET AND STATEMENT OF BASIS
ENSIGN-BICKFORD COMPANY
UPDES PERMIT # UT0025283
RENEWAL PERMIT FOR MINOR INDUSTRIAL FACILITY**

FACILITY CONTACT: Mr. Haldon R. Jaussi
Director of Environmental Remediation
The Ensign-Bickford Company
Facility Address: 8305 South Highway 6 & 89
Mailing Address: 3298 North Main Street
Spanish Fork, Utah 84660
Phone: (801) 554-9134

DESCRIPTION OF FACILITY: An explosives manufacturing plant has been operated at the present Ensign-Bickford Company (EBCo) site since prior to World War II. Around June of 1986 a large quantity of dilute nitric acid was released at this facility as the result of liner failure in a storage pond. Prior to 1988 the wastewater disposal practices at the EBCo site may have included disposal of industrial waste from explosives production into unlined ditches, pits, and ponds. Elevated concentrations of nitrates, and low concentrations of constituents of energetic materials (CEM's) have been detected in a municipal water supply well owned and operated by Mapleton City. This prompted Mapleton City to remove this well from service in November of 1994. EBCo, in cooperation with Mapleton City and the Utah Department of Environmental Quality (DEQ) has developed a plan to reactivate the well for use in either the municipal water system or in a municipal pressurized irrigation system. The following compounds have been detected in the Mapleton No. 1 well:

Nitrate	
RDX	Cyclotrimethylenetrinitramine
EGDN	Ethylene Glycol Dinitrate; Nitroglycol; Glycol Dinitrate
DEGDN	Diethylene Glycol Dinitrate; Dinitrodiglycol

In addition to the compounds identified above, the following compounds have been detected in ground water between the EBCo site and the Mapleton No. 1 well:

HMX	Cyclotetramethylenetetranitramine
PETN	Pentaerythritol Tetranitrate
TEGDN	Triethylene Glycol Dinitrate
TMETN	Metriol Trinitrate; 1,3-Propanediol; 2-Methylnitrate
BTTN	Butanetriol Trinitrate
TNT	Trinitrotoluene

DEQ has required that the Mapleton No. 1 well be pumped to serve as a hydraulic barrier to impede further northward migration of nitrate and other CEM's. To comply with this condition, the Mapleton No. 1 well reactivation alternative has been designed to include surface water discharge that enables pumping of the well when municipal demand requirements do not warrant the well's use. The reactivation plan includes the utilization of a granular activated carbon (GAC) treatment system that will remove CEM's from the ground water prior to use in the culinary and/or pressurized irrigation systems. No reduction of nitrate concentration is contemplated for water discharged to surface water, nor will any be required to meet the permit effluent limitations contained in this permit.

The Hobbie Creek portion of the Facility consists of flow from the Mapleton GAC facility and the Orton GAC facility with a discharge to either the Mapleton pressurized Irrigation System or directly to Hobbie Creek. The flow from the Mapleton GAC makes up roughly 2/3's of the flow and the Orton GAC makes up roughly 1/3 of the flow to the system.

The Spanish Fork treatment facility is located at 3710 East Hwy. 6 in Spanish Fork. This discharge is mostly, if not completely, discharged to the City of Spanish Fork's pressurized irrigation system and only makes the Spanish Fork River when irrigation activities do not warrant its' use (approximately November through March). Effluent is piped via a conveyance pipeline (approximately 4.5 miles of 12-inch diameter PVC) from the treatment facility to a vault (located approximately 500 feet from the river), where it blends with other waters not associated with this groundwater recovery process before reaching the river.

DESCRIPTION OF DISCHARGES: Final discharge from Outfall 001 is directly to Hobbie Creek where it passes under Main Street. This discharge point is located at latitude 40° 08' 52" and longitude 111° 34' 40" with STORET No. 499559. During the irrigation season, the facility discharges to the Mapleton City pressurized irrigation system with the flow being direct to a storage impoundment located east of the city. There is no public access to this storage impoundment. Outfall 001 is located at latitude 111° 34' 40" and longitude 40° 08' 52".

Discharge from Outfall 002 will be to the pressurized irrigation system or discharge to the Spanish Fork River depending on the season. Discharges to the Spanish Fork River will only be allowed when the background flow of the Spanish Fork River is 12 cfs or greater. If background falls below 12 cfs, discharge in the Spanish Fork River shall cease until such time the upstream flow in the Spanish Fork River equals or exceeds 12 cfs. Outfall 002 is located at a latitude of 111° 35' 21" and a longitude of 40° 05' 06".

STREAM CLASSIFICATION:

According to the Utah Water Quality Standards as contained in R317-2, the Hobbie Creek is classified as indicated below:

- 2B protected for secondary contact recreation such as boating, wading, or similar uses.
- 3A protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
- 4 protected for agricultural uses including irrigation of crops and stock watering.

According to Utah Water Quality Standards contained in Utah Administrative Code (UAC) R317-2, the Spanish Fork River is classified as:

- 2B - protected for secondary contact recreation such as boating, wading, or similar uses.
- 3B - protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- 3D - protected for water fowl, shore birds, and other water-oriented wildlife not included in classes 3A, 3B or 3C, including the necessary aquatic organisms in their food chain.
- 4 - protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS: *Utah Administrative Code (UAC) R317-1-3* lists State secondary treatment standards for five-day biochemical oxygen demand (BOD5), total suspended solids (TSS), fecal coliforms, total coliforms, and pH. Based on data provided in the original permit application, and because the effluent is composed only of ground water, BOD5, TSS, and *E. coli* limitations are not necessary, thus will not be included in this permit. However, pH is applicable to this discharge permit and will be limited to between 6.5 and 9.0 at Outfall 001.

Total dissolved solids and ammonia nitrogen will not be included in this permit because there is no reasonable potential for these parameters to exceed water quality standards (effluent limitations that were derived from the wasteload allocation are much higher in concentration than that measured in the groundwater discharge/effluent).

Additional concerns addressed in this permit are the concentration and types of organic constituents in the effluent. As discussed above, a number of organic compounds are found to be present in the effluent. Most of these organic compounds are at very low concentrations, and the major confirmed component of all the organics is RDX. Therefore, if RDX concentrations are sufficiently controlled then other organic parameters should likewise remain below concentrations of concern. There is no State numeric water quality standard for RDX. However, there is a published EPA Lifetime Drinking Water Health Advisory (Office of Drinking Water, U.S. EPA, Washington D.C., November 1988) for RDX of 0.002 mg/L. The methodology for deriving the 0.002 mg/L health advisory for RDX has been challenged by EBCo, and will continue to be the subject of further evaluation by EBCo and the Department of Environmental Quality. Until an alternate resolution is determined, the lifetime health advisory will serve as the basis for establishing the effluent limits (e.g., the concentration of RDX, after mixing in the receiving stream, shall not exceed 0.002 mg/L).

Nitrate nitrogen is also a parameter of concern. It is included in the State drinking water standards at a concentration of 10 mg/l and is included in the State water quality standards as a pollution indicator (4 mg/L in order to protect against eutrophication). If it appears that the in-stream mix may exceed 4 mg/L, either that limit must be met, or an appropriate stream assessment must be completed to determine what in-stream mix is appropriate. An impact assessment was made by Dr. Laverne B. Merritt on the amount of nitrate nitrogen that can be discharged without impact in Hobble Creek and Utah Lake. In summary, Dr. Merritt recommended that 10 mg/L nitrate nitrogen be considered the maximum total downstream concentration in Hobble Creek. Dr. Merritt felt that the 10 mg/L downstream mix concentration would alleviate any drinking water concerns and would have insignificant effects on the eutrophication of Hobble Creek or Utah Lake. The wasteload allocation for this facility supports this assessment and is discussed below.

The wasteload allocation indicates that there are six flow ranges needed to determine specific RDX and nitrate nitrogen effluent limit concentrations at Outfall 001 and Outfall 002. These flow ranges, and the corresponding effluent limit concentrations for RDX and nitrate nitrogen are shown in the tables below. EBCo will be required to meet the RDX and nitrate nitrogen concentrations of the flow range associated with the highest flow rate of the month. For example, if EBCo's discharges varied in any particular month, but reached no higher than 2.0 cfs at any time, then the flow range would be considered in the 1.68-2.23 cfs range in the table, and the corresponding effluent limitation would be 0.007 mg/L for RDX, and 32.5 mg/L for nitrate nitrogen. EBCo's maximum effluent flow rate is limited to 6.13 cfs by this permit. When calculating these effluent limits, the maximum flow rate for each flow range was used as the effluent flow in the mass balance equation. Additionally, an additional 20% margin of safety factor was included when determining the final effluent limitation. The results of these calculations can be found in Table 2.

There is no published standard analytical method in the literature (which has been certified by EPA) as an approved method for detection of such low concentrations of RDX and other CEM compounds. Therefore, it was up to the State and the permittee to develop an appropriate analytical method for RDX and other CEM compounds. EPA Method SW8330 has been modified to facilitate low concentration quantification of RDX and other CEM compounds. Future advances in analytical technology may warrant appropriate modifications to this method.

WHOLE EFFLUENT TOXICITY (WET) TESTING REQUIREMENTS: The primary basis for requiring a permit for this discharge is the presence of organic compounds, and the potential toxicity risk they present. However, it is acknowledged that the permittee is only discharging groundwater, not process wastewater, and there have been no WET testing failures during the previous permit coverage period. Therefore, acute and chronic testing shall be required yearly on an alternating basis. The permit will contain a reopener provision to include additional WET testing requirements and/or limits if warranted in the future.

STORM WATER REQUIREMENTS: EBCo will not need to apply for an industrial storm water permit at this time. However, if it is known that one acre or more of ground will be disturbed during future construction activities, a storm water construction permit will be required. The Company has expressed their preference for such coverage under the Utah General Permit as opposed to including applicable requirements in this permit. Any such permit must be obtained before construction activities begin.

PRETREATMENT REQUIREMENTS: It is not contemplated that discharges covered under this permit will be discharged directly to the sanitary sewer; however, water from back wash of GAC treatment units and/or carbon transfer slurry water could be discharged to the sanitary sewer. Any wastewater, discharged to a public sanitary sewer is subject to Federal, State, and local pretreatment regulations. Pursuant to Section 307 of the Clean Water Act, EBCo shall comply with all applicable Federal pretreatment regulations promulgated in *40 CFR Section 403*, the State pretreatment requirements found in *UAC R317-8-8*, and any specific local discharge limitations developed by the wastewater treatment plant accepting any process wastewater from EBCo.

TABLE 1: SUMMARY OF EFFLUENT LIMITATIONS:

Effluent Limitations:

Table 1: Effluent Limitations Outfall 001				
Parameter, Units	30-Day Average	7-Day Average	Daily Minimum	Daily Maximum
pH, S.U.	NA	NA	6.5	9.0
Nitrate-Nitrogen, mg/L	NA	NA	NA	a/
RDX, ug/L /b	NA	NA	NA	a/
Flow, cfs	NA	NA	NA	3.34
DO, mg/L	NA	NA	4.5, c/	NA
WET Testing	NA	NA	NA	Pass/Fail d/

a/ Nitrate nitrogen and RDX limitations are based upon effluent flow ranges as indicated in the tables below. The permittee is required to meet the RDX and nitrate-nitrogen concentrations of the

flow range associated with the highest flow rate of the month. The permittee is not allowed to discharge more than 3.34 cfs at any time.

b/ Analyses of RDX shall be made by the method appended to the fact sheet and statement of basis in Appendix A, or by any other method approved in writing by the Director.

c/ DO limits are only applicable during non-irrigation season (November-March)

d/ Acute Pass LC_{50} , Chronic Pass for Outfall 001 IC_{25} = 46.3% effluent, Outfall 2 IC_{25} = 22% effluent.

Table 2: RDX And Nitrate-Nitrogen Limits Based for Outfall 001

Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate- Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0285	128.9
0.57 - 1.11	0.0152	69.1
1.12 - 1.67	0.0106	48.8
1.68 - 2.23	0.0070	32.5
2.34 - 2.79	0.0050	23.5
2.80 - 3.34	0.0041	19.3

Table 3: RDX And Nitrate-Nitrogen Limits Based for Outfall 002

Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate- Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0449	124.1
0.57 - 1.11	0.0236	67.6
1.12 - 1.67	0.0164	48.3
1.68 - 2.23	0.0128	38.7
2.34 - 2.79	0.0106	32.9
2.80 - 3.34	0.0092	29.1

*Assumes an upstream (background) nitrate-nitrogen concentration of 1 mg/L.

Table 4: Self-Monitoring and Reporting Requirements a/			
Parameter	Sampling Frequency	Sample Type	Units
pH	Monthly	Immediate	S.U.
Nitrate Nitrogen	Monthly	Grab	mg/L
RDX	Monthly	Grab	mg/L
Flow b/ c/	Continuous	Recorded	cfs
DO	Monthly	Immediate	mg/L
WET	Yearly /d	Grab	Pass/Fail

- a/ See Definitions, *Part VIII*, for definition of terms.
- b/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
- c/ If the flow in the Spanish Fork River immediately upstream of the point where this discharge enters the river drops below 12 cfs (7.8 MGD) the permittee shall cease discharging until the upstream flow again exceeds 12 cfs
- d/ The facility shall alternate between the Chronic and Acute tests.

TMDL REQUIREMENTS: This facility ultimately discharges to Utah Lake which is listed on Utah's 303(d) list of impaired waterbodies as defined in the Clean Water Act. As required under federal regulations, a total maximum daily load (TMDL) will be developed for all 303(d) listed waters. Specifically, Utah Lake has been identified as impaired for total phosphorous (TP) and Total Dissolved Solids (TDS). Currently, a TMDL evaluation is underway for the lake. The TMDL process may result in pollutant load reductions and wasteload allocations for either of these constituents. Wasteload allocations would then be translated to effluent limits in UPDES permits. It is therefore strongly recommended that the facilities' staff participate in the TMDL process. It is also recommended that the facility self-monitor TP and TDS on a monthly basis in order to better quantify their contribution of phosphorus and Total Dissolved Solids loading to the lake. The TMDL staff at the Division of Water Quality will be responsible for scheduling and notifying appropriate facilities personnel regarding TMDL meetings. In addition, please contact your UPDES permit writer for information on scheduled TMDL meetings.

SIGNIFICANT CHANGES:

This permit is combining two existing permits into one permit coverage. As a result, the Permit for Ensign Bickford Spanish Fork Facility is being eliminated (UPDES # UT0025275) There are no significant changes to the effluent limits for the facilities. WET testing has been changed from yearly to Biannually with alternating species.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

PUBLIC NOTICE

The Permit was public noticed in the Provo Daily Herald and on the Division of Water Quality's website from March 10, 2014 until April 10, 2014. No comments were received during the comment period.

Drafted by Lonnie Shull
Environmental Scientist
Utah Division of Water Quality

APPENDIX A:

DEVELOPMENT OF EFFLUENT LIMITATIONS FOR RDX

$$C_{up} F_{up} + C_e F_e = C_{ds} F_{ds} \quad \text{Normal mass balance equation.}$$

C_{up} = Concentration upstream

F_{up} = Upstream flow in cfs

C_e = Concentration in the effluent

F_e = Effluent flow

C_{ds} = Concentration downstream

F_{ds} = Downstream flow = $F_{up} + F_e$

$$C_e F_e = C_{ds} F_{ds} - C_{up} F_{up}$$

$$C_e = \frac{C_{ds} F_{ds} - C_{up} F_{up}}{F_e}$$

$$F_{ds} = F_{up} + F_e$$

$$C_e = \frac{C_{ds} (F_{up} + F_e) - (C_{up} F_{up})}{F_e}$$

Plug in the real values:

$$C_{ds} = 0.002 \text{ mg/L}$$

$$F_{up} = 7.1 \text{ cfs which will be considered as the 7Q10 for this constituent.}$$

$$C_{up} = \text{Background RDX concentration which must be taken as } 0 \text{ mg/L.}$$

$$F_e = \text{Effluent flow } 6.13 \text{ cfs}$$

$$C_e = \frac{0.002 \text{ mg/L} * (9.0 \text{ cfs} + 6.13 \text{ cfs}) - (0 \text{ mg/L} * 7.1 \text{ cfs})}{6.13 \text{ cfs}}$$

$$C_e = 0.0043 \text{ mg/L}$$

The results of effluent limit calculations for RDX are summarized in tables presented previously in the Statement of Basis.

DEVELOPMENT OF EFFLUENT LIMITATIONS FOR NITRATE-NITROGEN

Using the same equation as for nitrate-nitrogen:

$$C_e = \frac{C_{ds} (F_{up} + F_e) - (C_{up} * F_{up})}{F_e}$$

Plug in the real values:

$$C_{ds} = 10.0 \text{ mg/L.}$$

$$F_{up} = 7.1 \text{ cfs which will be considered as the 7Q10 for this constituent.}$$

$$C_{up} = \text{Background nitrate-nitrogen concentration} = 1.0 \text{ mg/L.}$$

$$F_e = \text{Effluent flow } 6.13 \text{ cfs}$$

$$C_e = \frac{10.0 \text{ mg/L} * (9.0 \text{ cfs} + 6.13 \text{ cfs}) - (1.0 \text{ mg/L} * 7.1 \text{ cfs})}{6.13 \text{ cfs}}$$

$$C_e = 20.4 \text{ mg/L}$$

The results of effluent limit calculations for nitrate-nitrogen are summarized in tables presented previously in the Statement of Basis.

Table 2: RDX And Nitrate-Nitrogen Limits Based for Outfall 001		
Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate- Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0285	128.9
0.57 - 1.11	0.0152	69.1
1.12 - 1.67	0.0106	48.8
1.68 - 2.23	0.0070	32.5
2.34 - 2.79	0.0050	23.5
2.80 - 3.34	0.0041	19.3

Table 3: RDX And Nitrate-Nitrogen Limits Based for Outfall 002		
Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate- Nitrogen Concentration (mg/L)*
0.00 - 0.56	0.0449	124.1
0.57 - 1.11	0.0236	67.6
1.12 - 1.67	0.0164	48.3
1.68 - 2.23	0.0128	38.7
2.34 - 2.79	0.0106	32.9
2.80 - 3.34	0.0092	29.1

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility: Ensign Bickford Hobble Creek

UPDES No: UT-0025283

Current Flow: 3.96 MGD 6.13 cfs

Design Flow 3.96 MGD 6.13 cfs

Receiving Water: Hobble Creek

Stream Classification: 2B, 3A, 4

Stream Flows [cfs]: 7.1 Summer (July-Sept) 7Q10

7.1 Fall (Oct-Dec) 7Q10

7.1 Winter (Jan-Mar) 7Q10

7.1 Spring (Apr-June) 7Q10

40.0 Average

Stream TDS Values: 358.0 Summer (July-Sept) 80th Percentile

332.0 Fall (Oct-Dec) 80th Percentile

291.0 Winter (Jan-Mar) 80th Percentile

264.0 Spring (Apr-June) 80th Percentile

Effluent Limits:

Flow, MGD: 3.96 MGD Design Flow

BOD, mg/l: 25.0 Summer 5.0 Indicator

Dissolved Oxygen, mg/l: 4.5 Summer 6.5 30 Day Average

TNH₃, Chronic, mg/l: 15.4 Summer Varies Function of pH and Temperature

TDS, mg/l: 2175.9 Summer 1200.0

WQ Standard:

Modeling Parameters:

Acute River Width: 50.0%

Chronic River Width: 100.0%

Antidegradation Level II Review is NOT Required

Date: 2/25/2013

Permit Writer: _____

WLA by: _____

WQM Sec. Approval: _____

TMDL Sec. Approval: _____

**Utah Division of Water Quality
Salt Lake City, Utah**

**WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis**

25-Feb-13
4:00 PM

Facilities: Ensign Bickford Hobbie Creek
Discharging to: Hobbie Creek

UPDES No.: UT-0025283

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated in terms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

Hobbie Creek:	2B, 3A, 4
Antidegradation Review:	Antidegradation Level II Review is NOT Required

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	6.50 mg/l (30 Day Average) 5.00 mg/l (7Day Average) 4.00 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

**Utah Division of Water Quality
Salt Lake City, Utah**

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aluminum	87.00 ug/l**	2.873 lbs/day	750.00	ug/l	24.765 lbs/day
Arsenic	190.00 ug/l	6.274 lbs/day	340.00	ug/l	11.227 lbs/day
Cadmium	0.51 ug/l	0.017 lbs/day	5.15	ug/l	0.170 lbs/day
Chromium III	175.32 ug/l	5.789 lbs/day	3667.94	ug/l	121.114 lbs/day
ChromiumVI	11.00 ug/l	0.363 lbs/day	16.00	ug/l	0.528 lbs/day
Copper	19.57 ug/l	0.646 lbs/day	31.69	ug/l	1.046 lbs/day
Iron			1000.00	ug/l	33.020 lbs/day
Lead	9.59 ug/l	0.317 lbs/day	246.21	ug/l	8.130 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.079 lbs/day
Nickel	108.63 ug/l	3.587 lbs/day	977.05	ug/l	32.262 lbs/day
Selenium	4.60 ug/l	0.152 lbs/day	20.00	ug/l	0.660 lbs/day
Silver	N/A ug/l	N/A lbs/day	16.82	ug/l	0.555 lbs/day
Zinc	249.80 ug/l	8.248 lbs/day	249.80	ug/l	8.248 lbs/day

* Allowed below discharge

**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO₃

Metals Standards Based upon a Hardness of 238 mg/l as CaCO₃

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aldrin			1.500	ug/l	0.050 lbs/day
Chlordane	0.004 ug/l	0.307 lbs/day	1.200	ug/l	0.040 lbs/day
DDT, DDE	0.001 ug/l	0.071 lbs/day	0.550	ug/l	0.018 lbs/day
Dieldrin	0.002 ug/l	0.135 lbs/day	1.250	ug/l	0.041 lbs/day
Endosulfan	0.056 ug/l	3.992 lbs/day	0.110	ug/l	0.004 lbs/day
Endrin	0.002 ug/l	0.164 lbs/day	0.090	ug/l	0.003 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.271 lbs/day	0.260	ug/l	0.009 lbs/day
Lindane	0.080 ug/l	5.703 lbs/day	1.000	ug/l	0.033 lbs/day
Methoxychlor			0.030	ug/l	0.001 lbs/day
Mirex			0.010	ug/l	0.000 lbs/day
Parathion			0.040	ug/l	0.001 lbs/day
PCB's	0.014 ug/l	0.998 lbs/day	2.000	ug/l	0.066 lbs/day
Pentachlorophenol	13.00 ug/l	926.754 lbs/day	20.000	ug/l	0.660 lbs/day
Toxephene	0.0002 ug/l	0.014 lbs/day	0.7300	ug/l	0.024 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

IV. Numeric Stream Standards for Protection of Agriculture

4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Load*	
Arsenic		100.0 ug/l	lbs/day
Boron		750.0 ug/l	lbs/day
Cadmium		10.0 ug/l	0.17 lbs/day
Chromium		100.0 ug/l	lbs/day
Copper		200.0 ug/l	lbs/day
Lead		100.0 ug/l	lbs/day
Selenium		50.0 ug/l	lbs/day
TDS, Summer		1200.0 mg/l	19.81 tons/day

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
Metals	Concentration	Load*	
Arsenic		ug/l	lbs/day
Barium		ug/l	lbs/day
Cadmium		ug/l	lbs/day
Chromium		ug/l	lbs/day
Lead		ug/l	lbs/day
Mercury		ug/l	lbs/day
Selenium		ug/l	lbs/day
Silver		ug/l	lbs/day
Fluoride (3)		ug/l	lbs/day
to		ug/l	lbs/day
Nitrates as N		ug/l	lbs/day
Chlorophenoxy Herbicides			
2,4-D		ug/l	lbs/day
2,4,5-TP		ug/l	lbs/day
Endrin		ug/l	lbs/day
ocyclohexane (Lindane)		ug/l	lbs/day
Methoxychlor		ug/l	lbs/day
Toxaphene		ug/l	lbs/day

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

Maximum Conc., ug/l - Acute Standards			
Class 1C		Class 3A, 3B	
Toxic Organics			
	[2 Liters/Day for 70 Kg Person over 70 Yr.]		[6.5 g for 70 Kg Person over 70 Yr.]
Acenaphthene	ug/l lbs/day	2700.0 ug/l	192.48 lbs/day
Acrolein	ug/l lbs/day	780.0 ug/l	55.61 lbs/day
Acrylonitrile	ug/l lbs/day	0.7 ug/l	0.05 lbs/day
Benzene	ug/l lbs/day	71.0 ug/l	5.06 lbs/day
Benzidine	ug/l lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	ug/l lbs/day	4.4 ug/l	0.31 lbs/day
Chlorobenzene	ug/l lbs/day	21000.0 ug/l	1497.06 lbs/day
1,2,4-Trichlorobenzene			
Hexachlorobenzene	ug/l lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	ug/l lbs/day	99.0 ug/l	7.06 lbs/day

Utah Division of Water Quality
Salt Lake City, Utah

1,1,1-Trichloroethane				
Hexachloroethane	ug/l	lbs/day	8.9 ug/l	0.63 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	ug/l	lbs/day	42.0 ug/l	2.99 lbs/day
1,1,2,2-Tetrachloroethane	ug/l	lbs/day	11.0 ug/l	0.78 lbs/day
Chloroethane			0.0 ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4 ug/l	0.10 lbs/day
2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0 ug/l	306.54 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5 ug/l	0.46 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0 ug/l	33.51 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0 ug/l	28.52 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0 ug/l	1211.91 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	185.35 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	185.35 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1 ug/l	0.01 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2 ug/l	0.23 lbs/day
1,2-trans-Dichloroethylene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0 ug/l	56.32 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0 ug/l	2.78 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0 ug/l	121.19 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0 ug/l	163.96 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1 ug/l	0.65 lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5 ug/l	0.04 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0 ug/l	2067.37 lbs/day
Fluoranthene	ug/l	lbs/day	370.0 ug/l	26.38 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	ug/l	lbs/day	170000.0 ug/l	12119.09 lbs/day
Bis(2-chloroethoxy) methane	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methylene chloride (HM)	ug/l	lbs/day	1600.0 ug/l	114.06 lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0 ug/l	25.66 lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0 ug/l	1.57 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0 ug/l	2.42 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0 ug/l	3.56 lbs/day
Hexachlorocyclopentadiene	ug/l	lbs/day	17000.0 ug/l	1211.91 lbs/day
Isophorone	ug/l	lbs/day	600.0 ug/l	42.77 lbs/day
Naphthalene				
Nitrobenzene	ug/l	lbs/day	1900.0 ug/l	135.45 lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0 ug/l	998.04 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0 ug/l	54.54 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1 ug/l	0.58 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0 ug/l	1.14 lbs/day
N-Nitrosodi-n-propylamine	ug/l	lbs/day	1.4 ug/l	0.10 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2 ug/l	0.58 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

Phenol	ug/l	lbs/day	4.6E+06 ug/l	3.28E+05 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9 ug/l	0.42 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0 ug/l	370.70 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0 ug/l	855.47 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	ug/l	lbs/day	120000.0 ug/l	8554.65 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06 ug/l	2.07E+05 lbs/day
Benzo(a)anthracene (P)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0 ug/l	784.18 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9 ug/l	0.63 lbs/day
Toluene	ug/l	lbs/day	200000 ug/l	14257.76 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0 ug/l	5.77 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0 ug/l	37.43 lbs/day
				lbs/day
Pesticides				lbs/day
Aldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dieldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Chlordane	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDT	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDE	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDD	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.14 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.14 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0 ug/l	0.14 lbs/day
Endrin	ug/l	lbs/day	0.8 ug/l	0.06 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8 ug/l	0.06 lbs/day
Heptachlor	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1254 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 122	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 123	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1248 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1260 (Arochlor 126	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1016 (Arochlor 101	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Pesticide				
Toxaphene	ug/l		0.0 ug/l	0.00 lbs/day
Dioxin				
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day		

**Utah Division of Water Quality
Salt Lake City, Utah**

Metals

Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	306.54 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	15683.53 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.01 lbs/day
Nickel			4600.00 ug/l	327.93 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.45 lbs/day
Zinc				

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

**Utah Division of Water Quality
Salt Lake City, Utah**

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al.
Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

	Stream		pH	T-NH3 mg/l as N	BOD5 mg/l	DO mg/l	TRC mg/l	TDS mg/l
	Flow cfs	Temp. Deg. C						
Critical Low								
Summer (Irrig. Season)	7.1	20.2	8.0	0.03	0.10	6.83	0.00	358.0
Fall	7.1	8.5	8.2	0.03	0.10	---	0.00	332.0
Winter	7.1	7.3	8.2	0.03	0.10	---	0.00	332.0
Spring	7.1	11.7	8.2	0.03	0.10	---	0.00	332.0
Dissolved Metals	Al ug/l	As ug/l	Cd ug/l	CrIII ug/l	CrVI ug/l	Copper ug/l	Fe ug/l	Pb ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.83*	0.53*
Dissolved Metals	Hg ug/l	Ni ug/l	Se ug/l	Ag ug/l	Zn ug/l	Boron ug/l		
All Seasons	0.0000	0.53*	1.06*	0.1*	0.053*	10.0		* 1/2 MDL

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Salt Lake City, Utah**

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	3.96000	NA	500.00	8.25495
Fall	3.96000	NA		
Winter	3.96000	NA		
Spring	3.96000	NA		

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

Season	Daily Average	
Summer	3.960 MGD	6.126 cfs
Fall	3.960 MGD	6.126 cfs
Winter	3.960 MGD	6.126 cfs
Spring	3.960 MGD	6.126 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 3.96 MGD. If the discharger is allowed to have a flow greater than 3.96 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segments if the values below are met.

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	46.3% Effluent	[Chronic]

**Utah Division of Water Quality
Salt Lake City, Utah**

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

Season	Concentration	
Summer	25.0 mg/l as BOD5	825.5 lbs/day
Fall	25.0 mg/l as BOD5	825.5 lbs/day
Winter	25.0 mg/l as BOD5	825.5 lbs/day
Spring	25.0 mg/l as BOD5	825.5 lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

Season	Concentration
Summer	4.50
Fall	4.50
Winter	4.50
Spring	4.50

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		Concentration	Load	
Summer	4 Day Avg. - Chronic	15.4 mg/l as N	509.9	lbs/day
	1 Hour Avg. - Acute	70.0 mg/l as N	2,310.1	lbs/day
Fall	4 Day Avg. - Chronic	15.4 mg/l as N	509.9	lbs/day
	1 Hour Avg. - Acute	69.7 mg/l as N	2,301.0	lbs/day
Winter	4 Day Avg. - Chronic	15.4 mg/l as N	509.0	lbs/day
	1 Hour Avg. - Acute	69.7 mg/l as N	2,300.2	lbs/day
Spring	4 Day Avg. - Chronic	15.4 mg/l as N	0.0	lbs/day
	1 Hour Avg. - Acute	69.7 mg/l as N	0.0	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.%.

**Utah Division of Water Quality
Salt Lake City, Utah**

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		Concentration		Load	
Summer	4 Day Avg. - Chronic	0.024	mg/l	0.78	lbs/day
	1 Hour Avg. - Acute	0.041	mg/l	1.35	lbs/day
Fall	4 Day Avg. - Chronic	0.024	mg/l	0.78	lbs/day
	1 Hour Avg. - Acute	0.041	mg/l	1.35	lbs/day
Winter	4 Day Avg. - Chronic	0.024	mg/l	0.78	lbs/day
	1 Hour Avg. - Acute	0.041	mg/l	1.35	lbs/day
Spring	4 Day Avg. - Chronic	0.024	mg/l	0.00	lbs/day
	1 Hour Avg. - Acute	0.041	mg/l	0.00	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	2175.9	mg/l	35.92	tons/day
Fall	Maximum, Acute	2206.0	mg/l	36.42	tons/day
Winter	Maximum, Acute	2253.5	mg/l	37.21	tons/day
Spring	4 Day Avg. - Chronic	2284.8	mg/l	37.72	tons/day

Colorado Salinity Forum Limits Determined by Permitting Section

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 238 mg/l):

	4 Day Average		Load	1 Hour Average		Load
	Concentration			Concentration		
Aluminum	N/A		N/A	1,183.2	ug/l	39.1 lbs/day
Arsenic	409.28	ug/l	8.7 lbs/day	536.6	ug/l	17.7 lbs/day
Cadmium	1.02	ug/l	0.0 lbs/day	8.1	ug/l	0.3 lbs/day
Chromium III	377.58	ug/l	8.1 lbs/day	5,793.0	ug/l	191.3 lbs/day
Chromium VI	19.14	ug/l	0.4 lbs/day	23.0	ug/l	0.8 lbs/day
Copper	41.33	ug/l	0.9 lbs/day	49.6	ug/l	1.6 lbs/day
Iron	N/A		N/A	1,578.8	ug/l	52.1 lbs/day
Lead	19.79	ug/l	0.4 lbs/day	388.4	ug/l	12.8 lbs/day
Mercury	0.03	ug/l	0.0 lbs/day	3.8	ug/l	0.1 lbs/day
Nickel	233.61	ug/l	5.0 lbs/day	1,542.8	ug/l	50.9 lbs/day
Selenium	8.09	ug/l	0.2 lbs/day	30.7	ug/l	1.0 lbs/day
Silver	N/A	ug/l	N/A lbs/day	26.6	ug/l	0.9 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

Zinc	539.21 ug/l	11.5 lbs/day	394.5	ug/l	13.0 lbs/day
Cyanide	11.23 ug/l	0.2 lbs/day	34.7	ug/l	1.1 lbs/day

**Effluent Limitations for Heat/Temperature based upon
Water Quality Standards**

Summer	24.5 Deg. C.	76.1 Deg. F
Fall	12.8 Deg. C.	55.0 Deg. F
Winter	11.6 Deg. C.	52.8 Deg. F
Spring	16.0 Deg. C.	60.8 Deg. F

**Effluent Limitations for Organics [Pesticides]
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Organics [Pesticides]
will be met with an effluent limit as follows:

	4 Day Average		1 Hour Average		
	Concentration	Load	Concentration	Load	
Aldrin			1.5E+00	ug/l	7.66E-02 lbs/day
Chlordane	4.30E-03 ug/l	1.42E-01 lbs/day	1.2E+00	ug/l	6.13E-02 lbs/day
DDT, DDE	1.00E-03 ug/l	3.30E-02 lbs/day	5.5E-01	ug/l	2.81E-02 lbs/day
Dieldrin	1.90E-03 ug/l	6.27E-02 lbs/day	1.3E+00	ug/l	6.39E-02 lbs/day
Endosulfan	5.60E-02 ug/l	1.85E+00 lbs/day	1.1E-01	ug/l	5.62E-03 lbs/day
Endrin	2.30E-03 ug/l	7.59E-02 lbs/day	9.0E-02	ug/l	4.60E-03 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	5.11E-04 lbs/day
Heptachlor	3.80E-03 ug/l	1.25E-01 lbs/day	2.6E-01	ug/l	1.33E-02 lbs/day
Lindane	8.00E-02 ug/l	2.64E+00 lbs/day	1.0E+00	ug/l	5.11E-02 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	1.53E-03 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	5.11E-04 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	2.04E-03 lbs/day
PCB's	1.40E-02 ug/l	4.62E-01 lbs/day	2.0E+00	ug/l	1.02E-01 lbs/day
Pentachlorophenol	1.30E+01 ug/l	4.29E+02 lbs/day	2.0E+01	ug/l	1.02E+00 lbs/day
Toxephene	2.00E-04 ug/l	6.60E-03 lbs/day	7.3E-01	ug/l	3.73E-02 lbs/day

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Salt Lake City, Utah**

**Effluent Targets for Pollution Indicators
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

	1 Hour Average	
	Concentration	Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	165.1 lbs/day
Nitrates as N	4.0 mg/l	132.1 lbs/day
Total Phosphorus as P	0.05 mg/l	1.7 lbs/day
Total Suspended Solids	90.0 mg/l	2971.8 lbs/day

Note: Pollution indicator targets are for information purposes only.

**Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)**

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

	Maximum Concentration	
	Concentration	Load
Toxic Organics		
Acenaphthene	5.83E+03 ug/l	1.92E+02 lbs/day
Acrolein	1.68E+03 ug/l	5.56E+01 lbs/day
Acrylonitrile	1.42E+00 ug/l	4.71E-02 lbs/day
Benzene	1.53E+02 ug/l	5.06E+00 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	9.50E+00 ug/l	3.14E-01 lbs/day
Chlorobenzene	4.53E+04 ug/l	1.50E+03 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	1.66E-03 ug/l	5.49E-05 lbs/day
1,2-Dichloroethane	2.14E+02 ug/l	7.06E+00 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	1.92E+01 ug/l	6.34E-01 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	9.07E+01 ug/l	2.99E+00 lbs/day
1,1,2,2-Tetrachloroethane	2.37E+01 ug/l	7.84E-01 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	3.02E+00 ug/l	9.98E-02 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	9.28E+03 ug/l	3.07E+02 lbs/day
2,4,6-Trichlorophenol	1.40E+01 ug/l	4.63E-01 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.01E+03 ug/l	3.35E+01 lbs/day
2-Chlorophenol	8.64E+02 ug/l	2.85E+01 lbs/day
1,2-Dichlorobenzene	3.67E+04 ug/l	1.21E+03 lbs/day
1,3-Dichlorobenzene	5.61E+03 ug/l	1.85E+02 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

1,4-Dichlorobenzene	5.61E+03 ug/l	1.85E+02 lbs/day
3,3'-Dichlorobenzidine	1.66E-01 ug/l	5.49E-03 lbs/day
1,1-Dichloroethylene	6.91E+00 ug/l	2.28E-01 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	1.71E+03 ug/l	5.63E+01 lbs/day
1,2-Dichloropropane	8.42E+01 ug/l	2.78E+00 lbs/day
1,3-Dichloropropylene	3.67E+03 ug/l	1.21E+02 lbs/day
2,4-Dimethylphenol	4.97E+03 ug/l	1.64E+02 lbs/day
2,4-Dinitrotoluene	1.96E+01 ug/l	6.49E-01 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	1.17E+00 ug/l	3.85E-02 lbs/day
Ethylbenzene	6.26E+04 ug/l	2.07E+03 lbs/day
Fluoranthene	7.99E+02 ug/l	2.64E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	3.67E+05 ug/l	1.21E+04 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	3.45E+03 ug/l	1.14E+02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	7.77E+02 ug/l	2.57E+01 lbs/day
Dichlorobromomethane(HM)	4.75E+01 ug/l	1.57E+00 lbs/day
Chlorodibromomethane (HM)	7.34E+01 ug/l	2.42E+00 lbs/day
Hexachlorocyclopentadiene	3.67E+04 ug/l	1.21E+03 lbs/day
Isophorone	1.30E+03 ug/l	4.28E+01 lbs/day
Naphthalene		
Nitrobenzene	4.10E+03 ug/l	1.35E+02 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	3.02E+04 ug/l	9.98E+02 lbs/day
4,6-Dinitro-o-cresol	1.65E+03 ug/l	5.45E+01 lbs/day
N-Nitrosodimethylamine	1.75E+01 ug/l	5.77E-01 lbs/day
N-Nitrosodiphenylamine	3.45E+01 ug/l	1.14E+00 lbs/day
N-Nitrosodi-n-propylamine	3.02E+00 ug/l	9.98E-02 lbs/day
Pentachlorophenol	1.77E+01 ug/l	5.85E-01 lbs/day
Phenol	9.93E+06 ug/l	3.28E+05 lbs/day
Bis(2-ethylhexyl)phthalate	1.27E+01 ug/l	4.21E-01 lbs/day
Butyl benzyl phthalate	1.12E+04 ug/l	3.71E+02 lbs/day
Di-n-butyl phthalate	2.59E+04 ug/l	8.55E+02 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	2.59E+05 ug/l	8.55E+03 lbs/day
Dimethyl phthlate	6.26E+06 ug/l	2.07E+05 lbs/day
Benzo(a)anthracene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Benzo(a)pyrene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Benzo(b)fluoranthene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Benzo(k)fluoranthene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Chrysene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	6.69E-02 ug/l	2.21E-03 lbs/day

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Salt Lake City, Utah**

Pyrene (PAH)	2.37E+04 ug/l	7.84E+02 lbs/day
Tetrachloroethylene	1.92E+01 ug/l	6.34E-01 lbs/day
Toluene	4.32E+05 ug/l	1.43E+04 lbs/day
Trichloroethylene	1.75E+02 ug/l	5.77E+00 lbs/day
Vinyl chloride	1.13E+03 ug/l	3.74E+01 lbs/day

Pesticides

Aldrin	3.02E-04 ug/l	9.98E-06 lbs/day
Dieldrin	3.02E-04 ug/l	9.98E-06 lbs/day
Chlordane	1.27E-03 ug/l	4.21E-05 lbs/day
4,4'-DDT	1.27E-03 ug/l	4.21E-05 lbs/day
4,4'-DDE	1.27E-03 ug/l	4.21E-05 lbs/day
4,4'-DDD	1.81E-03 ug/l	5.99E-05 lbs/day
alpha-Endosulfan	4.32E+00 ug/l	1.43E-01 lbs/day
beta-Endosulfan	4.32E+00 ug/l	1.43E-01 lbs/day
Endosulfan sulfate	4.32E+00 ug/l	1.43E-01 lbs/day
Endrin	1.75E+00 ug/l	5.77E-02 lbs/day
Endrin aldehyde	1.75E+00 ug/l	5.77E-02 lbs/day
Heptachlor	4.53E-04 ug/l	1.50E-05 lbs/day
Heptachlor epoxide		

PCB's

PCB 1242 (Arochlor 1242)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1254 (Arochlor 1254)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1221 (Arochlor 1221)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1232 (Arochlor 1232)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1248 (Arochlor 1248)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1260 (Arochlor 1260)	9.72E-05 ug/l	3.21E-06 lbs/day
PCB-1016 (Arochlor 1016)	9.72E-05 ug/l	3.21E-06 lbs/day

Pesticide

Toxaphene	1.62E-03 ug/l	5.35E-05 lbs/day
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Metals

Antimony	ug/l	lbs/day
Arsenic	ug/l	lbs/day
Asbestos	ug/l	lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	ug/l	lbs/day
Cyanide	ug/l	lbs/day
Lead		
Mercury	ug/l	lbs/day
Nickel	ug/l	lbs/day
Selenium		
Silver		
Thallium	ug/l	lbs/day
Zinc		

**Utah Division of Water Quality
Salt Lake City, Utah**

Dioxin

Dioxin (2,3,7,8-TCDD)

3.02E-08 ug/l

9.98E-10 lbs/day

**Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule**

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		1183.2				1183.2	N/A
Antimony				9283.6		9283.6	
Arsenic	215.9	536.6			0.0	215.9	409.3
Barium						0.0	
Beryllium						0.0	
Cadmium	21.5	8.1			0.0	8.1	1.0
Chromium (III)		5793.0			0.0	5793.0	377.6
Chromium (VI)	215.0	23.0			0.0	22.97	19.14
Copper	430.9	49.6				49.6	41.3
Cyanide		34.7	474973.8			34.7	11.2
Iron		1578.8				1578.8	
Lead	215.0	388.4			0.0	215.0	19.8
Mercury		3.79		0.32	0.0	0.32	0.026
Nickel		1542.8		9931.3		1542.8	233.6
Selenium	106.1	30.7			0.0	30.7	8.1
Silver		26.6			0.0	26.6	
Thallium				13.6		13.6	
Zinc		394.5				394.5	539.2
Boron	1619.2					1619.2	

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	WLA Chronic ug/l	
Aluminum	1183.2	N/A	
Antimony	9283.58		
Arsenic	215.9	409.3	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	8.1	1.0	
Chromium (III)	5793.0	378	
Chromium (VI)	23.0	19.1	
Copper	49.6	41.3	

**Utah Division of Water Quality
Salt Lake City, Utah**

Cyanide	34.7	11.2	
Iron	1578.8		
Lead	215.0	19.8	
Mercury	0.324	0.026	
Nickel	1542.8	234	
Selenium	30.7	8.1	
Silver	26.6	N/A	
Thallium	13.6		
Zinc	394.5	539.2	Acute Controls
Boron	1619.23		

Other Effluent Limitations are based upon R317-1.

E. coli 126.0 organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is NOT Required

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

**Utah Division of Water Quality
Salt Lake City, Utah**

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

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**Utah Division of Water Quality
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APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day 2.000	CBOD Coeff. FORCED (Kd)/day 0.000	CBOD Coeff. (Ka)T 1/day 2.018	REAER. Coeff. (Ka)20 (Ka)/day 30.644	REAER. Coeff. FORCED 1/day 0.000	REAER. Coeff. (Ka)T 1/day 30.783	NBOD Coeff. (Kn)20 1/day 0.400	NBOD Coeff. (Kn)T 1/day 0.406
Open Coeff. (K4)20 1/day 0.000	Open Coeff. (K4)T 1/day 0.000	NH3 LOSS (K5)20 1/day 4.000	NH3 (K5)T 1/day 4.035	NO2+NO3 LOSS (K6)20 1/day 0.000	NO2+NO3 (K6)T 1/day 0.000	TRC Decay K(Cl)20 1/day 32.000	TRC K(Cl)(T) 1/day 32.356
BENTHIC DEMAND (SOD)20 gm/m2/day 1.000	BENTHIC DEMAND (SOD)T gm/m2/day 1.012						
K1 CBOD {theta} 1.0	K2 Reaer. {theta} 1.0	K3 NH3 {theta} 1.1	K4 Open {theta} 1.0	K5 NH3 Loss {theta} 1.0	K6 NO2+3 {theta} 1.0	K(Cl) TRC {theta} 1.1	S Benthic {theta} 1.1

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Salt Lake City, Utah

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Review by: _____

6/11/2013

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility: Ensign Bickford Spanish Fork

UPDES No: UT-0025275

Current Flow: 2.16 MGD 3.34 cfs

Design Flow 2.16 MGD 3.34 cfs

Receiving Water: Spanish Fork River

Stream Classification: 2B, 3B, 3D, 4

Stream Flows [cfs]: 12.0 Summer (July-Sept) Permit Flow Minimum
12.0 Fall (Oct-Dec) Permit Flow Minimum
12.0 Winter (Jan-Mar) Permit Flow Minimum
12.0 Spring (Apr-June) Permit Flow Minimum

276.0 Average
Stream TDS Values: 244.0 Summer (July-Sept) Average
437.0 Fall (Oct-Dec) Average
417.0 Winter (Jan-Mar) Average
316.0 Spring (Apr-June) Average

Effluent Limits:

Flow, MGD: 2.16 MGD Design Flow
BOD, mg/l: 25.0 Summer 5.0 Indicator
Dissolved Oxygen, mg/l: 4.0 Summer 5.5 30 Day Average
TNH₃, Chronic, mg/l: 32.8 Summer Varies Function of pH and Temperature
TDS, mg/l: 4633.2 Summer 1200.0

WQ Standard:

Modeling Parameters:

Acute River Width: 50.0%

Chronic River Width: 100.0%

Antidegradation Level II Review is NOT Required

Date: 2/25/2013

Permit Writer: _____

WLA by: _____

WQM Sec. Approval: _____

TMDL Sec. Approval: _____

**Utah Division of Water Quality
Salt Lake City, Utah**

**WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis**

25-Feb-13
4:00 PM

Facilities: Ensign Bickford Spanish Fork
Discharging to: Spanish Fork River

UPDES No: UT-0025275

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated in terms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

Spanish Fork River:	2B, 3B, 3D, 4
Antidegradation Review:	Antidegradation Level II Review is NOT Required

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.50 mg/l (30 Day Average) 4.00 mg/l (7Day Average) 3.00 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

**Utah Division of Water Quality
Salt Lake City, Utah**

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aluminum	87.00 ug/l**	1.567 lbs/day	750.00	ug/l	13.508 lbs/day
Arsenic	190.00 ug/l	3.422 lbs/day	340.00	ug/l	6.124 lbs/day
Cadmium	0.50 ug/l	0.009 lbs/day	5.00	ug/l	0.090 lbs/day
Chromium III	171.08 ug/l	3.081 lbs/day	3579.34	ug/l	64.467 lbs/day
Chromium VI	11.00 ug/l	0.198 lbs/day	16.00	ug/l	0.288 lbs/day
Copper	19.08 ug/l	0.344 lbs/day	30.81	ug/l	0.555 lbs/day
Iron			1000.00	ug/l	18.011 lbs/day
Lead	9.24 ug/l	0.166 lbs/day	237.03	ug/l	4.269 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.043 lbs/day
Nickel	105.92 ug/l	1.908 lbs/day	952.68	ug/l	17.159 lbs/day
Selenium	4.60 ug/l	0.083 lbs/day	20.00	ug/l	0.360 lbs/day
Silver	N/A ug/l	N/A lbs/day	15.97	ug/l	0.288 lbs/day
Zinc	243.56 ug/l	4.387 lbs/day	243.56	ug/l	4.387 lbs/day

* Allowed below discharge

**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO₃

Metals Standards Based upon a Hardness of 231 mg/l as CaCO₃

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aldrin			1.500	ug/l	0.027 lbs/day
Chlordane	0.004 ug/l	0.356 lbs/day	1.200	ug/l	0.022 lbs/day
DDT, DDE	0.001 ug/l	0.083 lbs/day	0.550	ug/l	0.010 lbs/day
Dieldrin	0.002 ug/l	0.157 lbs/day	1.250	ug/l	0.023 lbs/day
Endosulfan	0.056 ug/l	4.631 lbs/day	0.110	ug/l	0.002 lbs/day
Endrin	0.002 ug/l	0.190 lbs/day	0.090	ug/l	0.002 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.314 lbs/day	0.260	ug/l	0.005 lbs/day
Lindane	0.080 ug/l	6.615 lbs/day	1.000	ug/l	0.018 lbs/day
Methoxychlor			0.030	ug/l	0.001 lbs/day
Mirex			0.010	ug/l	0.000 lbs/day
Parathion			0.040	ug/l	0.001 lbs/day
PCB's	0.014 ug/l	1.158 lbs/day	2.000	ug/l	0.036 lbs/day
Pentachlorophenol	13.00 ug/l	1074.980 lbs/day	20.000	ug/l	0.360 lbs/day
Toxephene	0.0002 ug/l	0.017 lbs/day	0.7300	ug/l	0.013 lbs/day

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Salt Lake City, Utah**

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Load*	Concentration	Load*
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.09 lbs/day
Chromium			100.0 ug/l	lbs/day
Copper			200.0 ug/l	lbs/day
Lead			100.0 ug/l	lbs/day
Selenium			50.0 ug/l	lbs/day
TDS, Summer			1200.0 mg/l	10.81 tons/day

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Load*	Concentration	Load*
Metals				
Arsenic			ug/l	lbs/day
Barium			ug/l	lbs/day
Cadmium			ug/l	lbs/day
Chromium			ug/l	lbs/day
Lead			ug/l	lbs/day
Mercury			ug/l	lbs/day
Selenium			ug/l	lbs/day
Silver			ug/l	lbs/day
Fluoride (3)			ug/l	lbs/day
to			ug/l	lbs/day
Nitrates as N			ug/l	lbs/day

Chlorophenoxy Herbicides

2,4-D	ug/l	lbs/day
2,4,5-TP	ug/l	lbs/day
Endrin	ug/l	lbs/day
ocyclohexane (Lindane)	ug/l	lbs/day
Methoxychlor	ug/l	lbs/day
Toxaphene	ug/l	lbs/day

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		Class 3A, 3B	
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]		[6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	ug/l	lbs/day	2700.0 ug/l	223.27 lbs/day
Acrolein	ug/l	lbs/day	780.0 ug/l	64.50 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7 ug/l	0.05 lbs/day
Benzene	ug/l	lbs/day	71.0 ug/l	5.87 lbs/day
Benzidine	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	ug/l	lbs/day	4.4 ug/l	0.36 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0 ug/l	1736.51 lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	ug/l	lbs/day	99.0 ug/l	8.19 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

1,1,1-Trichloroethane				
Hexachloroethane	ug/l	lbs/day	8.9 ug/l	0.74 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	ug/l	lbs/day	42.0 ug/l	3.47 lbs/day
1,1,2,2-Tetrachloroethane	ug/l	lbs/day	11.0 ug/l	0.91 lbs/day
Chloroethane			0.0 ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4 ug/l	0.12 lbs/day
2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0 ug/l	355.57 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5 ug/l	0.54 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0 ug/l	38.86 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0 ug/l	33.08 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0 ug/l	1405.74 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	215.00 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	215.00 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1 ug/l	0.01 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2 ug/l	0.26 lbs/day
1,2-trans-Dichloroethylene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0 ug/l	65.33 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0 ug/l	3.22 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0 ug/l	140.57 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0 ug/l	190.19 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1 ug/l	0.75 lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5 ug/l	0.04 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0 ug/l	2398.03 lbs/day
Fluoranthene	ug/l	lbs/day	370.0 ug/l	30.60 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	ug/l	lbs/day	170000.0 ug/l	14057.43 lbs/day
Bis(2-chloroethoxy) methane	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methylene chloride (HM)	ug/l	lbs/day	1600.0 ug/l	132.31 lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0 ug/l	29.77 lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0 ug/l	1.82 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0 ug/l	2.81 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0 ug/l	4.13 lbs/day
Hexachlorocyclopentadiene	ug/l	lbs/day	17000.0 ug/l	1405.74 lbs/day
Isophorone	ug/l	lbs/day	600.0 ug/l	49.61 lbs/day
Naphthalene				
Nitrobenzene	ug/l	lbs/day	1900.0 ug/l	157.11 lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0 ug/l	1157.67 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0 ug/l	63.26 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1 ug/l	0.67 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0 ug/l	1.32 lbs/day
N-Nitrosodi-n-propylamine	ug/l	lbs/day	1.4 ug/l	0.12 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2 ug/l	0.68 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

Phenol	ug/l	lbs/day	4.6E+06 ug/l	3.80E+05 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9 ug/l	0.49 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0 ug/l	429.99 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0 ug/l	992.29 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	ug/l	lbs/day	120000.0 ug/l	9922.90 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06 ug/l	2.40E+05 lbs/day
Benzo(a)anthracene (P/	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0 ug/l	909.60 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9 ug/l	0.74 lbs/day
Toluene	ug/l	lbs/day	200000 ug/l	16538.16 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0 ug/l	6.70 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0 ug/l	43.41 lbs/day
				lbs/day
Pesticides				lbs/day
Aldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dieldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Chlordane	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDT	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDE	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDD	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.17 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.17 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0 ug/l	0.17 lbs/day
Endrin	ug/l	lbs/day	0.8 ug/l	0.07 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8 ug/l	0.07 lbs/day
Heptachlor	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1254 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1248 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1260 (Arochlor 124	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1016 (Arochlor 10	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Pesticide				
Toxaphene	ug/l		0.0 ug/l	0.00 lbs/day
Dioxin				
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day		

**Utah Division of Water Quality
Salt Lake City, Utah**

Metals

Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	355.57 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	18191.97 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.01 lbs/day
Nickel			4600.00 ug/l	380.38 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.52 lbs/day
Zinc				

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

**Utah Division of Water Quality
Salt Lake City, Utah**

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al.
Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

Stream								
Critical Low								
	Flow	Temp.	pH	T-NH3	BOD5	DO	TRC	TDS
	cfs	Deg. C		mg/l as N	mg/l	mg/l	mg/l	mg/l
Summer (Irrig. Season)	12.0	13.3	8.1	0.03	0.10	7.96	0.00	244.0
Fall	12.0	6.7	8.0	0.03	0.10	---	0.00	437.0
Winter	12.0	4.5	8.0	0.03	0.10	---	0.00	437.0
Spring	12.0	10.1	8.1	0.03	0.10	---	0.00	437.0
Dissolved	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.83*	0.53*
Dissolved	Hg	Ni	Se	Ag	Zn	Boron		
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.0000	0.53*	1.06*	0.1*	0.053*	10.0	* 1/2 MDL	

**Utah Division of Water Quality
Salt Lake City, Utah**

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	2.16000	NA	500.00	4.50270
Fall	2.16000	NA		
Winter	2.16000	NA		
Spring	2.16000	NA		

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

Season	Daily Average	
Summer	2.160 MGD	3.342 cfs
Fall	2.160 MGD	3.342 cfs
Winter	2.160 MGD	3.342 cfs
Spring	2.160 MGD	3.342 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 2.16 MGD. If the discharger is allowed to have a flow greater than 2.16 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segments if the values below are met.

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	21.8% Effluent	[Chronic]

**Utah Division of Water Quality
Salt Lake City, Utah**

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

Season	Concentration	
Summer	25.0 mg/l as BOD5	450.3 lbs/day
Fall	25.0 mg/l as BOD5	450.3 lbs/day
Winter	25.0 mg/l as BOD5	450.3 lbs/day
Spring	25.0 mg/l as BOD5	450.3 lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

Season	Concentration
Summer	4.00
Fall	4.00
Winter	4.00
Spring	4.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		Concentration	Load	
Summer	4 Day Avg. - Chronic	32.8 mg/l as N	591.4	lbs/day
	1 Hour Avg. - Acute	129.8 mg/l as N	2,337.5	lbs/day
Fall	4 Day Avg. - Chronic	32.8 mg/l as N	591.4	lbs/day
	1 Hour Avg. - Acute	129.4 mg/l as N	2,330.4	lbs/day
Winter	4 Day Avg. - Chronic	32.7 mg/l as N	589.4	lbs/day
	1 Hour Avg. - Acute	129.3 mg/l as N	2,328.4	lbs/day
Spring	4 Day Avg. - Chronic	32.8 mg/l as N	0.0	lbs/day
	1 Hour Avg. - Acute	129.4 mg/l as N	0.0	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.%,

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Salt Lake City, Utah**

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		Concentration		Load	
Summer	4 Day Avg. - Chronic	0.050	mg/l	0.90	lbs/day
	1 Hour Avg. - Acute	0.053	mg/l	0.95	lbs/day
Fall	4 Day Avg. - Chronic	0.050	mg/l	0.90	lbs/day
	1 Hour Avg. - Acute	0.053	mg/l	0.95	lbs/day
Winter	4 Day Avg. - Chronic	0.050	mg/l	0.90	lbs/day
	1 Hour Avg. - Acute	0.053	mg/l	0.95	lbs/day
Spring	4 Day Avg. - Chronic	0.050	mg/l	0.00	lbs/day
	1 Hour Avg. - Acute	0.053	mg/l	0.00	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	4633.2	mg/l	41.72	tons/day
Fall	Maximum, Acute	3940.1	mg/l	35.48	tons/day
Winter	Maximum, Acute	4011.9	mg/l	36.13	tons/day
Spring	4 Day Avg. - Chronic	4374.6	mg/l	39.40	tons/day

Colorado Salinity Forum Limits Determined by Permitting Section

**Effluent Limitations for Total Recoverable Metals based upon
Water Quality Standards**

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 231 mg/l):

	4 Day Average		Load	1 Hour Average		Load
	Concentration			Concentration		
Aluminum	N/A		N/A	2,092.4	ug/l	37.7 lbs/day
Arsenic	869.47	ug/l	10.1 lbs/day	949.1	ug/l	17.1 lbs/day
Cadmium	2.02	ug/l	0.0 lbs/day	13.8	ug/l	0.2 lbs/day
Chromium III	782.61	ug/l	9.1 lbs/day	10,004.9	ug/l	180.2 lbs/day
Chromium VI	36.23	ug/l	0.4 lbs/day	37.6	ug/l	0.7 lbs/day
Copper	84.74	ug/l	1.0 lbs/day	84.7	ug/l	1.5 lbs/day
Iron	N/A		N/A	2,793.3	ug/l	50.3 lbs/day
Lead	39.55	ug/l	0.5 lbs/day	661.2	ug/l	11.9 lbs/day
Mercury	0.06	ug/l	0.0 lbs/day	6.7	ug/l	0.1 lbs/day
Nickel	483.44	ug/l	5.6 lbs/day	2,661.9	ug/l	47.9 lbs/day
Selenium	15.41	ug/l	0.2 lbs/day	53.1	ug/l	1.0 lbs/day
Silver	N/A	ug/l	N/A lbs/day	44.7	ug/l	0.8 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

Zinc	1,117.94 ug/l	13.0 lbs/day	680.7	ug/l	12.3 lbs/day
Cyanide	23.87 ug/l	0.3 lbs/day	61.5	ug/l	1.1 lbs/day

**Effluent Limitations for Heat/Temperature based upon
Water Quality Standards**

Summer	18.9 Deg. C.	66.0 Deg. F
Fall	12.3 Deg. C.	54.1 Deg. F
Winter	10.1 Deg. C.	50.2 Deg. F
Spring	15.7 Deg. C.	60.2 Deg. F

**Effluent Limitations for Organics [Pesticides]
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Organics [Pesticides]
will be met with an effluent limit as follows:

	4 Day Average		1 Hour Average		
	Concentration	Load	Concentration		Load
Aldrin			1.5E+00	ug/l	4.18E-02 lbs/day
Chlordane	4.30E-03 ug/l	7.74E-02 lbs/day	1.2E+00	ug/l	3.34E-02 lbs/day
DDT, DDE	1.00E-03 ug/l	1.80E-02 lbs/day	5.5E-01	ug/l	1.53E-02 lbs/day
Dieldrin	1.90E-03 ug/l	3.42E-02 lbs/day	1.3E+00	ug/l	3.48E-02 lbs/day
Endosulfan	5.60E-02 ug/l	1.01E+00 lbs/day	1.1E-01	ug/l	3.06E-03 lbs/day
Endrin	2.30E-03 ug/l	4.14E-02 lbs/day	9.0E-02	ug/l	2.51E-03 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	2.79E-04 lbs/day
Heptachlor	3.80E-03 ug/l	6.84E-02 lbs/day	2.6E-01	ug/l	7.24E-03 lbs/day
Lindane	8.00E-02 ug/l	1.44E+00 lbs/day	1.0E+00	ug/l	2.79E-02 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	8.36E-04 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	2.79E-04 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	1.11E-03 lbs/day
PCB's	1.40E-02 ug/l	2.52E-01 lbs/day	2.0E+00	ug/l	5.57E-02 lbs/day
Pentachlorophenol	1.30E+01 ug/l	2.34E+02 lbs/day	2.0E+01	ug/l	5.57E-01 lbs/day
Toxephene	2.00E-04 ug/l	3.60E-03 lbs/day	7.3E-01	ug/l	2.03E-02 lbs/day

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Salt Lake City, Utah**

**Effluent Targets for Pollution Indicators
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

	1 Hour Average	
	Concentration	Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	90.1 lbs/day
Nitrates as N	4.0 mg/l	72.0 lbs/day
Total Phosphorus as P	0.05 mg/l	0.9 lbs/day
Total Suspended Solids	90.0 mg/l	1621.0 lbs/day

Note: Pollution indicator targets are for information purposes only.

**Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)**

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

	Maximum Concentration	
	Concentration	Load
Toxic Organics		
Acenaphthene	1.24E+04 ug/l	2.23E+02 lbs/day
Acrolein	3.58E+03 ug/l	6.45E+01 lbs/day
Acrylonitrile	3.03E+00 ug/l	5.46E-02 lbs/day
Benzene	3.26E+02 ug/l	5.87E+00 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	2.02E+01 ug/l	3.64E-01 lbs/day
Chlorobenzene	9.64E+04 ug/l	1.74E+03 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	3.54E-03 ug/l	6.37E-05 lbs/day
1,2-Dichloroethane	4.55E+02 ug/l	8.19E+00 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	4.09E+01 ug/l	7.36E-01 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.93E+02 ug/l	3.47E+00 lbs/day
1,1,2,2-Tetrachloroethane	5.05E+01 ug/l	9.10E-01 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	6.43E+00 ug/l	1.16E-01 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	1.97E+04 ug/l	3.56E+02 lbs/day
2,4,6-Trichlorophenol	2.98E+01 ug/l	5.37E-01 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	2.16E+03 ug/l	3.89E+01 lbs/day
2-Chlorophenol	1.84E+03 ug/l	3.31E+01 lbs/day
1,2-Dichlorobenzene	7.81E+04 ug/l	1.41E+03 lbs/day
1,3-Dichlorobenzene	1.19E+04 ug/l	2.15E+02 lbs/day

**Utah Division of Water Quality
Salt Lake City, Utah**

1,4-Dichlorobenzene	1.19E+04 ug/l	2.15E+02 lbs/day
3,3'-Dichlorobenzidine	3.54E-01 ug/l	6.37E-03 lbs/day
1,1-Dichloroethylene	1.47E+01 ug/l	2.65E-01 lbs/day
1,2-trans-Dichloroethylene		
2,4-Dichlorophenol	3.63E+03 ug/l	6.53E+01 lbs/day
1,2-Dichloropropane	1.79E+02 ug/l	3.22E+00 lbs/day
1,3-Dichloropropylene	7.81E+03 ug/l	1.41E+02 lbs/day
2,4-Dimethylphenol	1.06E+04 ug/l	1.90E+02 lbs/day
2,4-Dinitrotoluene	4.18E+01 ug/l	7.52E-01 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	2.48E+00 ug/l	4.47E-02 lbs/day
Ethylbenzene	1.33E+05 ug/l	2.40E+03 lbs/day
Fluoranthene	1.70E+03 ug/l	3.06E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	7.81E+05 ug/l	1.41E+04 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	7.35E+03 ug/l	1.32E+02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.65E+03 ug/l	2.98E+01 lbs/day
Dichlorobromomethane(HM)	1.01E+02 ug/l	1.82E+00 lbs/day
Chlorodibromomethane (HM)	1.56E+02 ug/l	2.81E+00 lbs/day
Hexachlorocyclopentadiene	7.81E+04 ug/l	1.41E+03 lbs/day
Isophorone	2.75E+03 ug/l	4.96E+01 lbs/day
Naphthalene		
Nitrobenzene	8.72E+03 ug/l	1.57E+02 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	6.43E+04 ug/l	1.16E+03 lbs/day
4,6-Dinitro-o-cresol	3.51E+03 ug/l	6.33E+01 lbs/day
N-Nitrosodimethylamine	3.72E+01 ug/l	6.70E-01 lbs/day
N-Nitrosodiphenylamine	7.35E+01 ug/l	1.32E+00 lbs/day
N-Nitrosodi-n-propylamine	6.43E+00 ug/l	1.16E-01 lbs/day
Pentachlorophenol	3.76E+01 ug/l	6.78E-01 lbs/day
Phenol	2.11E+07 ug/l	3.80E+05 lbs/day
Bis(2-ethylhexyl)phthalate	2.71E+01 ug/l	4.88E-01 lbs/day
Butyl benzyl phthalate	2.39E+04 ug/l	4.30E+02 lbs/day
Di-n-butyl phthalate	5.51E+04 ug/l	9.92E+02 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	5.51E+05 ug/l	9.92E+03 lbs/day
Dimethyl phthlate	1.33E+07 ug/l	2.40E+05 lbs/day
Benzo(a)anthracene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Benzo(a)pyrene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Benzo(b)fluoranthene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Benzo(k)fluoranthene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Chrysene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	1.42E-01 ug/l	2.56E-03 lbs/day

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Salt Lake City, Utah**

Pyrene (PAH)	5.05E+04 ug/l	9.10E+02 lbs/day
Tetrachloroethylene	4.09E+01 ug/l	7.36E-01 lbs/day
Toluene	9.18E+05 ug/l	1.65E+04 lbs/day
Trichloroethylene	3.72E+02 ug/l	6.70E+00 lbs/day
Vinyl chloride	2.41E+03 ug/l	4.34E+01 lbs/day

Pesticides

Aldrin	6.43E-04 ug/l	1.16E-05 lbs/day
Dieldrin	6.43E-04 ug/l	1.16E-05 lbs/day
Chlordane	2.71E-03 ug/l	4.88E-05 lbs/day
4,4'-DDT	2.71E-03 ug/l	4.88E-05 lbs/day
4,4'-DDE	2.71E-03 ug/l	4.88E-05 lbs/day
4,4'-DDD	3.86E-03 ug/l	6.95E-05 lbs/day
alpha-Endosulfan	9.18E+00 ug/l	1.65E-01 lbs/day
beta-Endosulfan	9.18E+00 ug/l	1.65E-01 lbs/day
Endosulfan sulfate	9.18E+00 ug/l	1.65E-01 lbs/day
Endrin	3.72E+00 ug/l	6.70E-02 lbs/day
Endrin aldehyde	3.72E+00 ug/l	6.70E-02 lbs/day
Heptachlor	9.64E-04 ug/l	1.74E-05 lbs/day
Heptachlor epoxide		

PCB's

PCB 1242 (Arochlor 1242)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1254 (Arochlor 1254)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1221 (Arochlor 1221)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1232 (Arochlor 1232)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1248 (Arochlor 1248)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1260 (Arochlor 1260)	2.07E-04 ug/l	3.72E-06 lbs/day
PCB-1016 (Arochlor 1016)	2.07E-04 ug/l	3.72E-06 lbs/day

Pesticide

Toxaphene	3.44E-03 ug/l	6.20E-05 lbs/day
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Metals

Antimony	ug/l	lbs/day
Arsenic	ug/l	lbs/day
Asbestos	ug/l	lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	ug/l	lbs/day
Cyanide	ug/l	lbs/day
Lead		
Mercury	ug/l	lbs/day
Nickel	ug/l	lbs/day
Selenium		
Silver		
Thallium	ug/l	lbs/day
Zinc		

**Utah Division of Water Quality
Salt Lake City, Utah**

Dioxin

Dioxin (2,3,7,8-TCDD)

6.43E-08 ug/l

1.16E-09 lbs/day

**Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule**

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		2092.4				2092.4	N/A
Antimony				19742.1		19742.1	
Arsenic	459.1	949.1			0.0	459.1	869.5
Barium						0.0	
Beryllium						0.0	
Cadmium	45.6	13.8			0.0	13.8	2.0
Chromium (III)		10004.9			0.0	10004.9	782.6
Chromium (VI)	456.3	37.6			0.0	37.59	36.23
Copper	915.4	84.7				84.7	84.7
Cyanide		61.5	1010059.6			61.5	23.9
Iron		2793.3				2793.3	
Lead	456.3	661.2			0.0	456.3	39.6
Mercury		6.71		0.69	0.0	0.69	0.055
Nickel		2661.9		21119.4		2661.9	483.4
Selenium	223.8	53.1			0.0	53.1	15.4
Silver		44.7			0.0	44.7	
Thallium				28.9		28.9	
Zinc		680.7				680.7	1117.9
Boron	3443.4					3443.4	

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	WLA Chronic ug/l	
Aluminum	2092.4	N/A	
Antimony	19742.07		
Arsenic	459.1	869.5	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	13.8	2.0	
Chromium (III)	10004.9	783	
Chromium (VI)	37.6	36.2	
Copper	84.7	84.7	Acute Controls

**Utah Division of Water Quality
Salt Lake City, Utah**

Cyanide	61.5	23.9	
Iron	2793.3		
Lead	456.3	39.6	
Mercury	0.689	0.055	
Nickel	2661.9	483	
Selenium	53.1	15.4	
Silver	44.7	N/A	
Thallium	28.9		
Zinc	680.7	1117.9	Acute Controls
Boron	3443.39		

Other Effluent Limitations are based upon R317-1.

E. coli 126.0 organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is NOT Required

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

**Utah Division of Water Quality
Salt Lake City, Utah**

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

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Salt Lake City, Utah**

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day 2.000	CBOD Coeff. FORCED (Kd)/day 0.000	CBOD Coeff. (Ka)T 1/day 1.470	REAER. Coeff. (Ka)20 (Ka)/day 23.336	REAER. Coeff. FORCED 1/day 0.000	REAER. Coeff. (Ka)T 1/day 19.907	NBOD Coeff. (Kn)20 1/day 0.400	NBOD Coeff. (Kn)T 1/day 0.239
Open Coeff. (K4)20 1/day 0.000	Open Coeff. (K4)T 1/day 0.000	NH3 LOSS (K5)20 1/day 4.000	NH3 (K5)T 1/day 2.940	NO2+NO3 LOSS (K6)20 1/day 0.000	NO2+NO3 (K6)T 1/day 0.000	TRC Decay K(CI)20 1/day 32.000	TRC K(CI)(T) 1/day 21.657
BENTHIC DEMAND (SOD)20 gm/m2/day 1.000	BENTHIC DEMAND (SOD)T gm/m2/day 0.656						
K1 CBOD {theta} 1.0	K2 Reaer. {theta} 1.0	K3 NH3 {theta} 1.1	K4 Open {theta} 1.0	K5 NH3 Loss {theta} 1.0	K6 NO2+3 {theta} 1.0	K(CI) TRC {theta} 1.1	S Benthic {theta} 1.1

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Review by: _____

6/11/2013